SPECTRAL EMISSION OF NATURAL NaCl BY RADIOLUMINESCENCE, THERMOLUMINESCENCE AND INFRARED STIMULATED LUMINESCENCE

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Abstract

The luminescence properties of synthetic alkali halides in general and different doped synthetic sodium chloride (NaCl) in particular have been widely studied for dosimetric purposes. However, to the best of our knowledge, the spectral emission of natural NaCl (cooking salt) have never been reported till now. In this sense, this work reports on the thermoluminescence (TL), infrared stimulated luminescence (IRSL) and radioluminescence (RL) response of the natural NaCl in the range of 200-800nm. As observed in the 3D plots, the main TL emission appears, in the UV-blue region, only after the sample is X-ray or beta irradiated; the 'as received' samples scarcely exhibited a luminescence signal. The RL response reveals the appearance of two bands peaked at 290 nm and a wide broad band appearing at 480 nm that can be respectively related to the presence of colour centres in the NaCl lattice. The IRSL spectral emission of this material after 50Gy irradiation shows a low intensity wide broad band with non-well defined peaks.

Keywords: Radioluminescence, Thermoluminescence, Infrared stimulated luminescence, NaCl, spectral emission.